

WHAT IS CLAIMED IS:

1. An illumination and imaging system for acquiring an image of an illuminated target of interest, system comprising:
 - a detector for receiving light and providing an electrical representation of an image;
 - an optical system optically coupled to the detector;
 - a stop disposed within the optical system and having an aperture for passing a portion of the light therethrough, the stop having an asymmetrical feature about an optical axis of the stop; and
 - a light source mounted between the target and the stop, the light source shining light substantially normally onto a surface of the stop, wherein light reflected from the surface of the stop onto the target forms light received at the detector.
2. The system of claim 1, wherein the stop is formed of stainless steel.
3. The system of claim 1, wherein the stop includes a diffuse surface.
4. The system of claim 1, wherein the stop is coated with diffuse reflective material.
5. The system of claim 1, and further comprising a plurality of additional light sources

mounted substantially coplanar with the light source.

6. The system of claim 1, wherein the light source includes a Light Emitting Diode.

7. The system of claim 1, and further comprising a plurality of additional light source disposed to shine light substantially normally with respect to the surface of the stop.

8. The system of claim 1, wherein the telecentric optical system includes a first lens cell positioned between the detector and the stop.

9. The system of claim 8, and further comprising a baffle positioned between the first lens cell and the stop.

10. The system of claim 9, and further comprising at least one additional baffle positioned between the baffle and the stop.

11. The system of claim 1, wherein the stop and the light source are enclosed within an enclosure having a reflective interior.

12. The system of claim 11, wherein the enclosure is cylindrically shaped.

13. The system of claim 1, wherein the detector is a CCD array.

14. The system of claim 1, wherein the light

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source is positioned within the telecentric optical system.

15. The system of claim 1, and further comprising a plurality of additional tangs extending into the aperture and arranged asymmetrically about the aperture.

16. The system of claim 1, wherein the optical system is telecentric in object space.

17. The system of claim 1, and further comprising at least one tang extending into the aperture and arranged asymmetrically about the aperture.

18. An illuminator comprising:
a enclosure having an optical axis passing therethrough;
a stop disposed within the enclosure, the stop having a reflective surface and an aperture, wherein at least one tang extends into the aperture; and
at least one light source disposed within the enclosure and adapted to direct light toward the reflective surface substantially normally to the reflective surface.

19. An optical stop for use with an illuminator, the stop having an aperture alignable with an optical axis of the illuminator, the aperture having a feature therein arranged asymmetrically within the aperture.

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